

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) An encoder comprising a scale and a scale reader;

the scale having a plurality of reference marks spaced apart ~~in the lengthways~~
direction from each other;

the scale reader including a sensor which reads the reference marks;

~~characterised~~ characterized in that:

the reference marks are arranged along the scale in a random or pseudo-random pattern;

as the scale reader moves over the pattern of the reference marks, the pattern is continually compared with a previously stored pattern; and

when the pattern of the reference marks matches the previously stored pattern, a reference signal is output.

2. (Original) An encoder comprising a scale and a scale reader;

the scale having a series of incremental marks ~~extending along its length~~, and a plurality of reference marks spaced apart ~~in the lengthways~~ direction from each other;

the scale reader including one or more sensors which read the incremental marks and produce an output therefrom, and which read the reference marks;

~~characterised~~ characterized in that:

the reference marks are arranged along the scale in a random or pseudo-random pattern;

as the scale reader moves over the pattern of the reference marks, the pattern is continually compared with a previously stored pattern; and

when the pattern of the reference marks matches the previously stored pattern, a reference signal is output.

3. (Currently Amended) An encoder according to claim 1, including a counter which indicates the position of the readhead along the scale, said reference signal being connected to an input of the counter to reset the counter to a preset value.

4. (Currently Amended) An encoder according to claim 1, including a shift register, wherein values representing the pattern of the reference marks are read into the shift register as the scale reader passes over the reference marks, and the pattern in the shift register is compared to the previously stored pattern.
5. (Original) An encoder according to claim 4, wherein said values are introduced into one end of the shift register, and shifted along the shift register synchronously with the passing of the scale reader over the reference marks.
6. (Currently Amended) An encoder according to claim 4, wherein said values may be introduced into either end of the shift register, depending upon the direction of travel of the scale reader along the scale.
7. (Currently Amended) An encoder according to claim 1, including a memory for holding said previously stored pattern, and a comparator which compares the pattern of the reference marks from the scale with the previously stored pattern in the memory.
8. (Original) An encoder according to claim 7, including an input to the memory for storing said stored pattern therein, the pattern being received from the scale reader as the scale reader passes over the reference marks.
9. (Currently Amended) An encoder according to claim 4, including a memory for holding said previously stored pattern, and a comparator which compares the pattern of the reference marks in the shift register with the previously stored pattern in the memory.
10. (Original) An encoder according to claim 9, including an input to the memory for storing said stored pattern therein, the pattern being received from the shift register.
11. (Original) An encoder according to claim 10, including a circuit for determining the validity of the pattern in the shift register, and preventing said input being stored in the memory if it is invalid.